



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,963	03/26/2004	Thomas Rueckes	112020.146 US2 NAN-22	9816
23483	7590	11/29/2005	EXAMINER	
WILMER CUTLER PICKERING HALE AND DORR LLP			NGUYEN, DANG T	
60 STATE STREET			ART UNIT	
BOSTON, MA 02109			PAPER NUMBER	
			2824	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/810,963

Applicant(s)

RUECKES ET AL.

(110)

Examiner

Dang T. Nguyen

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/5/05 & 4/14/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Search history.

### **DETAILED ACTION**

1. This action is responsive to the following communications: the Application filed on March 26, 2004 and the Information Disclosure Statement filed on April 14, 2005 and January 05, 2005.
2. Claims 1 – 12 are pending in this case. Claims 1 and 12 are independent claims.

### ***Information Disclosure Statement***

3. Acknowledgment is made of applicant's Information Disclosure Statement (IDS) Form PTO-1449, filed on 04/14/05 and 01/05/05 have been considered.

### ***Claim Objections***

4. Claim 1 objected to because of the following informalities: In line 14, change "node" to -nodes-. Appropriate correction is required.

### ***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1- 12 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 11 of U.S. Patent No. 6,944,054.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the difference between claims' language can be understood as covering a same subject matter and the copending application anticipates the claimed invention as follow:

Regarding independent claim 1 of Application recites a non-volatile memory array (Col. 8 line 40, in Reference), comprising:

a plurality of memory cells (Col 8 line 41, in Reference) , each cell receiving a bit line, word line (Col. 8 lines 42-43, in Reference), and release line (Col. 8 line 47, in Reference);

each memory cell (Col. 8 line 41, in Reference) including a cell selection transistor (Col. 8 line 42, in reference) with first (Col. 8 line 53 [second terminal]), second (Col. 8 line 54 [third terminal]) and third (Col. 8 line 55 [first terminal]) nodes,

the first [second terminal] and second [third terminal] nodes being in respective electrical communication with the bit line and the word line (the reference teaches the first terminal connected to the select node (Col. 8 lines 53-54 and [Reference] and the control circuit communicates with a select node based on the bit line and word line.

*Therefore the first terminal communication with bit line and word line, and the second terminal have same communication with bit line and word line as first terminal).*

each cell further including an electromechanically deflectable switch (Col. 8 line 51, in Reference), having a first (Col. 8 line 53, in Reference [second terminal]), second (Col. 8 line 55, in Reference [third terminal]) and third (Col. 8 line 55, in Reference [first terminal]) node, the first node (Col. 8 line 53, in Reference [second terminal]) being in electrical communication with the release line (Col. 8 lines 48-50, in Reference) , and a third node (Col. 8 line 55, in Reference [second terminal]) being in electrical communication with the third node (Col. 8 line 53 [second terminal]) of the cell selection transistor, the electromechanically deflectable switch including a nanotube switching element physically positioned between the first (Col. 8 line 53, in Reference [second terminal]) and third nodes (Col. 8 line 55, in Reference [first terminal]) of the switch and in electrical communication with the second node (Col. 8 line 53, in Reference [third terminal]) of the switch (Col. 8 lines 57-58, in Reference) and wherein the second node (Col. 8 line 55, in Reference [third terminal]) of the switch is in communication with a reference signal (Col. 8 lines 55-56, in Reference);

wherein each nanotube switching element is deflectable into contact with the third node (Col. 8 line 55, in Reference [first terminal]) of the switch (Col. 8 lines 57-58, in Reference) in response to signals at the first (Col. 8 line 53, in Reference [second terminal]) and second (Col. 8 line 54, in Reference [third terminal]) node of the cell selection transistor (Col. 8 lines 58-60, in Reference) and is releasable from such

contact in response to a signal at the release line (Col. 8 lines 60-62, in Reference).

Thus, claim 1 of application claims the same subject matter as claim 1 of the patent.

Regarding dependent claim 2 of Application wherein the cell selection transistor is a FET and the second node of the transistor is a gate of the FET (Col. 9 lines 18-19, in Reference).

Regarding dependent claim 3 of Application, the memory array according to claim 1, wherein the nanotube switching element is a ribbon of nanotube fabric (see claim 2, in Reference).

Regarding dependent claim 4 of Application wherein each ribbon of nanotube fabric includes a plurality of carbon nanotubes (see claim 3, in Reference).

Regarding dependent claim 5 of Application wherein the nanotube fabric is porous (see claim 4, in Reference).

Regarding dependent claim 6 of Application wherein the nanotube fabric is substantially a monolayer of carbon nanotubes (see claim 5, in Reference). It is noted that a single-walled carbon nanotubes is equivalent to a monolayer of carbon nanotubes).

Regarding dependent claim 7 of Application wherein the nanotube fabric is formed of single-walled carbon nanotubes (see claim 6, in Reference).

Regarding dependent claim 8 of Application wherein informational state of a memory cell is manifested by the position of the nanotube switching element and wherein the position of the nanotube switching element is sensed on the bit line as a time variation of the bit line signal (see claim 7, in Reference).

Art Unit: 2824

Regarding dependent claims 10 and 11 of Application wherein the FET is a NFET and PFET (Col. 9 line 13, in Reference. NFET or PFET is a derivative part of FET transistor).

Regarding independent claim 12 of Application, the claim incorporates substantially similar subject matter as claim 1 of Application, and is rejected along the same rationale.

Thus, claims 2 – 8 and 10 - 12 of application claims the same subject matter as claims 1 – 11 of the patent.

### ***Prior art***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Frazier et al. Patent No. US 6,548,841 B2 Date of Patent: Dec. 2, 2004

Dean et al. Pub. No. US 2003/0042834 A1 Pub. Date: Mar. 6, 2003

### **Allowable Subject Matter**

8. Claim 9 would be allowable if rewritten to overcome the rejection(s) under double patent, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 9, the combination as claimed wherein at least the limitation of "the release line is shared among a plurality of memory cells and wherein activation of the release line causes all nanotube switching elements of the plurality of the memory cells sharing the release line to release from contact with a corresponding third node of the switch" is not disclosed, suggest, or rendered obvious by the prior art of record.

### **Contact Information**

9. Any inquiry concerning this communication from the examiner should be directed to Dang Nguyen, who can be reached by telephone at (571) 272-1955. Normal contact times are M-F, 8:00 AM - 4:30 PM.

Upon an unsuccessful attempt to contact the examiner, the examiner's supervisor, Richard Elms, may be reached at (571) 272-1869.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 305-3900. The faxed phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the Status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business



Application/Control Number: 10/810,963

Page 8

Art Unit: 2824

Center (EBC) at 866-217-9197 (toll-free) or EBC@uspto.gov.

Dang Nguyen 11/22/2005



Son T. Dinh  
Primary Examiner